

HUMAN OCCUPATIONAL ILLNESS PROBLEMS DUE TO EXPOSURE
TO ETHYL PARATHION IN CALIFORNIA IN 1978

By

Keith T. Maddy, Staff Toxicologist
Bob Barish, Agricultural Inspector

Worker Health and Safety Unit
Division of Pest Management, Environmental Protection,
and Worker Safety
California Department of Food and Agriculture
1220 N Street, Sacramento, California 95814

SUMMARY

There were 22 cases of occupational exposure to the agricultural pesticide ethyl parathion reported by California physicians in 1978. Of this total, 21 resulted in apparent systemic effects, and 1 caused symptoms of eye irritation. A total of 641,154 pounds of ethyl parathion were applied in California in 1978 according to the Department's Annual Pesticide Use Report. The greatest single cause of exposure to parathion was lack of care in the handling of spray equipment and in actual application. Eight cases apparently involved employee negligence, such as failure to use safety equipment provided by the employer, carelessness, and poor personal hygiene. One worker became ill even though he reportedly used all of the safety equipment specified on the label. Other exposures were due to a spill during a plane crash caused by a malfunctioning on take-off, a misunderstanding regarding the application date in a wildlife area by a mosquito abatement district worker, and a worker improperly cleaning the inside of a parathion mix tank. Also, there were 3 drift exposure incidents. Both the usage of parathion and the number of occupational illness cases due to exposure to parathion were reduced in 1978 from previous years.

CASE STUDIES

Mixer/Loaders

A loader had been working with parathion for 1 week when he began to complain of headaches, stomach cramps, and difficulties with his vision. He was treated for parathion poisoning. No pesticide training records were available for the worker. The physician and the pest control operator's medical supervisor had not been informed of the medical supervision requirements for employees using toxicity category 1 or 2 organophosphate pesticides. The worker was off the job for 6 days followed by 6 days of limited work activity.

Two workers who had been loading aircraft all day with pesticides including parathion became ill with symptoms of organophosphate poisoning. The employer said he brought canned soft drinks for both men which they may have drunk without first washing their hands or wiping the tops of the cans. Both were taken to the hospital for observation and treatment, and were released the next day.

A mixer/loader for a helicopter applicator became nauseated after working with parathion, Lannate, and paraquat. He also experienced abdominal and chest cramps and constricted pupils. The physician on the case diagnosed the illness as organophosphate poisoning and estimated that this employee would be unable to return to work for 2 weeks.

Ground Applicator

An applicator became ill after driving a speed sprayer and was taken to a hospital emergency room for treatment. He had been treating citrus with parathion the day before. The employer noted that this worker did not normally load pesticides; however, on the day of this illness, he may have been loading. A closed mixing/loading system was used. The worker stated that he could have been exposed to a small amount of drift behind his face shield; he did not wear a respirator as required.

A worker applied parathion to grapes in the morning, then cleaned up and put away his equipment. He showered and changed clothes after work, but later developed itching and went to the doctor. He was given atropine orally; no cholinesterase test was made. The doctor said the man exhibited symptoms of parathion poisoning in addition to his history of asthmatic problems.

A ground applicator was applying parathion in a navel orange grove in the morning. The spray jets clogged and, in attempting to clean them with a knife, his hands became soaked with parathion. He wiped his hands on his pants and then smoked a cigarette. Later that day, he broke out in a sweat, felt dizzy, and experienced shortness of breath. He was taken to a hospital where he was treated and kept for 1 day. This worker had not been wearing the required protective clothing.

Mixer/Loader/Applicator

A mixer/loader/applicator had been working with numerous pesticides for about 3 weeks. He had been given several warnings by his employer about the

lack of proper use of protective equipment, and on the day of the onset of illness, he had been warned twice. He had been working with parathion, Dasanit, and Devrinol the day of the illness. That evening he began to feel ill with symptoms of diarrhea and vomiting. The physician's diagnosis was pesticide poisoning, and parathion was considered as the most likely cause.

A spray rig operator was mixing, loading, and spraying parathion without using all the required safety equipment. He also apparently continued to mix while eating. He experienced symptoms of muscle weakness, tight chest wall, sore throat, and vomiting. He was hospitalized for one day. He had been spraying parathion for 3 weeks. No closed system was used because owner-operators are exempt from this requirement.

Aerial Applicators

A pilot was spraying parathion when the application nozzles clogged. The pilot discontinued spraying, landed, and cleaned the filter. When he removed the cap, parathion solution spilled on his arm. He experienced excessive salivation, tearing, loss of balance, nausea, vertigo, tightness of the chest, and esophogael burning. The pilot stated he was in a hurry and failed to wash his hand until after he finished spraying. He was treated by a physician for parathion poisoning.

A crop duster lost power at the end of an air strip. The pilot attempted to dump the load of parathion but the gate lever was in a locked position. The plane crashed approximately 150 yards beyond the strip. The pilot was covered with parathion when the hopper opened. He ran to the hangar and showered immediately, and was taken to the hospital. Pesticide poisoning was apparently not the cause of the plane accident. Symptoms included blurred vision and diaphoretic skin. He was treated by a physician.

Field Workers

A worker was exposed to parathion residue while picking oranges. The doctor's report specified this illness as a case of parathion intoxication. The worker lost 4 days of work and was limited in his activities for the 5 days subsequent to his return to work.

An irrigator who reportedly knew the orange field in which he was working had just been sprayed with parathion, and proceeded to prune brush over standpipes, a short distance away from the treated area. He became dizzy and nauseated with excessive sweating. The worker had stopped to roll a cigarette without washing his hands. The exposure occurred 7 days after the application which took place on May 1.

Manufacturing/Formulation/Delivery

A worker loading bags of parathion into boxes experienced irritation in both eyes, which he believed was due to parathion contact. The doctor's report indicated that no foreign bodies were found in the eyes. He lost 1 day of work.

A worker packaging pesticides was exposed to parathion. A closed system was reportedly used in the process. No hospitalization was required. No

residual symptoms were reported. Though exposure apparently did take place, the doctor's first report ruled out organophosphate poisoning. One day was lost from work.

A worker had been working in a warehouse and delivering parathion and Guthion for 4 days. Though no broken containers were found in the truck, this worker stated that the boxes he was loading were leaking parathion powder. While driving a delivery truck, the left side of his body, face, arms, and legs became numb. He went to a physician who diagnosed organophosphate poisoning.

Miscellaneous Job Categories

Two California Department of Fish and Game employees were clearing brush in a public wildlife area when they were caught in the drift of an aerial application of parathion by a mosquito abatement district. One of the workers experienced excessive tearing, nausea, vomiting, and abdominal, leg, and back cramps. The other worker experienced only a slight reaction. The employees were not taken to a physician immediately. When they were examined, the doctor stated his opinion that they had been exposed to parathion. The area in which the accident took place was supposed to have been sprayed 2 days earlier. The incident was apparently due to a lack of communication concerning the actual spray date.

Cleaner/Repairer

A tractor accident occurred after the driver became dizzy. The driver had been inside a parathion tank, cleaning it 4 times on the day prior to the illness. He was diagnosed as having mild organophosphate poisoning and was hospitalized for observation.

Drift

A geothermal well driller was working at a site approximately 35 yards from a sugarbeet field. While he was there, the field was sprayed with parathion, some of which apparently drifted into the well drilling area. The worker experienced vomiting and developed a rash. He later visited a doctor and was treated for organophosphate poisoning. The injury took place on September 22, and as of September 27, he had not returned to work.

Flagger

While flagging upwind from an application of parathion, a worker may have received a small amount of drift on his neck and face. He developed a rash 2 days later. He stated he had not gotten any drift on him, but that he has very sensitive facial skin and exhibits slight reactions even around fields sprayed some time prior to his entry into them. His regular cholinesterase testing indicated low levels, which returned to normal after 2 visits to the doctor. This worker missed 14 days of work.

Drift

A rancher's son had just parked his truck at the edge of a bean field when he was caught in the drift of an aerial application of parathion. He experienced blurred vision and headaches. He was cared for by a physician.

Hospitalization and Disability

Doctors' First Reports of Work Injury contain information on the length of time the physician expects the employee to be unable to perform his normal work activities. Information is also available on the number of days of hospitalization for the illness. Below is the total number of days of hospitalization and disability for 1976, 1977, and 1978 for all occupational illnesses reported by physicians to have been caused by exposure to parathion.

	1976 (38 cases)	1977 (67 cases)	1978 (22 cases)
Days of Hospitalization	8	8	5
Days of Disability	120	51	42

Telephone Survey of Some of the Individuals Who Experienced Occupational Exposure to Parathion in 1978

Out of a total of 22 individuals exposed to ethyl parathion in 1978, 8 were contacted by telephone in late May 1979. The other 18 individuals could not be located through directory assistance. Attempts beyond this, such as contacting employers, were not undertaken.

The goal of the survey was to screen for possible long-term effects from occupational exposure to parathion.

Two workers reported experiencing no ill effects beyond the day of exposure. Two of the remaining 6 workers reported that they felt they had fully recovered after 3 days, while another 2 reported complete recovery after 1 month. The remaining 2 workers reported long-term effects of differing severity. One worker reported that whereas he was quite healthy before his exposure, he has since felt generally unhealthy, contracting both pneumonia and mononucleosis since the exposure. The wife of the other worker (a field worker who did not speak English very well) stated that since his exposure, her husband has been able to work only half days, rather than the full days he worked before the exposure.

DISCUSSION

The following table is presented for comparative purposes:

<u>Year</u>	<u>Pounds of Parathion Used</u> ¹	<u>Total Number of Reported Occupational Exposures to Ethyl Parathion</u>
1975	912,000	68 (includes 1 incident involving 17 field workers)
1976	750,535	32
1977	1,007,027	62 (includes 1 incident involving 24 field workers)
1978	641,154	22

¹ Usage reported through the California pesticide use permit reporting system in the 1978 Annual Pesticide Use Report of the California Department of Food and Agriculture.

It is apparent that the pounds of parathion used and the number of human illness cases due to parathion exposure in 1978 were well below those for previous years.

The poisoning cases which occurred were, in almost all cases, the result of violations of well-established and well-known label requirements and regulations.